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(54) INTELLIGENT MAGIC CUBE, AND SENSING SHAFT CENTER STRUCTURE AND TIMING METHOD USED THEREBY

INTELLIGENTER MAGISCHER WÜRFEL UND MESSENDE WELLENMITTENSTRUKTUR UND DADURCH VERWENDETES TIMING-VERFAHREN

CUBE MAGIQUE INTELLIGENT, AINSI QUE STRUCTURE CENTRALE D'ARBRE DE DÉTECTION ET PROCÉDÉ DE SYNCHRONISATION CORRESPONDANTS

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Description

TECHNICAL FILED

[0001] The present disclosure relates to the technical field of magic cube structure, and more particularly, to an intelligent magic cube, and a sensing shaft center structure and a timing method used thereby.

BACKGROUND

[0002] Playing a magic cube is a kind of elegant body-building activity, it can train to use both hands and brain for human and is very effective in training people's movement skills. Moreover, it can enhance people's memory and spatial imagination, and it can cultivate people's endurance and perseverance. There are a number of organizations that regularly organize magic cube players to perform various competitions, such as speed twist, blind twist, and minimum step reduction, etc. However, in order to participate in these competitions, players have to go to the playing field in person, so that some players with disabilities or at a long distance may be unable to attend and be excluded. WO 86/05111 A1 discloses a spatial logic toy containing moveable and/or rotatable elements, which is capable of automatic counting and continuous registration of element-arranging steps without error. CN 103394191 A discloses an electronic three-order smart cube competition system, which includes a data acquisition module used to collect and output the data on the position change and rotation of the smart cube; a wireless communication module connected to the data acquisition module and used to receive and wirelessly transmit the data output by the data acquisition module; a data processing module used to receive the data transmitted by the wireless communication module and generate the control signal of the virtual smart cube and record the change process of the smart cube; and a virtual smart cube demo module. CN 102068814 A discloses a smart cube, which can detect the rotation direction and angle of each face of the smart cube, and process and memorize the recorded data through a microprocessing, and prompt the user how to recover the smart cube.

SUMMARY

[0003] The present invention is defined in the claims. The present disclosure provides an intelligent magic cube, which can be combined with a conventional electronic product to realize real-time networking of the state data of the magic cube, so that players in different places can participate various competitions, such as speed twist, blind twist, and minimum step reduction, etc., anytime and anywhere.

[0004] A sensing shaft center structure for an intelligent magic cube includes a body. The body includes a core having an internal cavity, and a plurality of tubular shafts connected to the core. The cavity is provided with an internal central control module including a state obtaining unit. The tubular shaft is provided with a state signal sending set including a signal selector and a plurality of signal exciters. The signal selector can be paired with any one of the signal exciters, and generate a corresponding state signal, and the state obtaining unit is configured to receive a state signal sent from the state signal sending set.

[0005] The state signal received by the state obtaining unit needs further processing to obtain the data with regard to the real-time state of the magic cube required by the intelligent magic cube. The data processing may be implemented in a plurality of ways. The central control module may further include a signal sending unit, a signal receiving unit, and an output unit, the signal sending unit may be configured to send the state signal received by the state obtaining unit to a signal receiving device of a peripheral device wirelessly, the signal receiving unit may be configured to receive feedback data from a processing device of a peripheral device, and the output unit may be connected to the signal receiving unit. Alternatively, the central control module may further include a processing unit, an output unit, and an output data sending unit, the processing unit may be configured to process the state signal provided by the state obtaining unit, the output unit may be connected to the processing unit, and the output data sending unit may be configured to send the data output from the processing unit to a data receiving device of the peripheral device.

[0006] The intelligent magic cube having the above-mentioned sensing shaft center structure further includes a center block. The number of the center blocks may correspond to the number of the tubular shafts, each of the center blocks may be rotatably connected to an end of a corresponding tubular shaft, and each of the center block is fixedly connected to the signal selector or the signal exciter of a corresponding state signal sending set.

[0007] The magic cube may be a second-order magic cube, a third-order magic cube, or even an odd-order magic cube with a fifth or higher order. When it is an odd-order magic cube with a fifth or higher order, the tubular shaft is provided with a plurality of state signal sending sets. The number of the state signal sending sets on one tubular shaft is a half of a value obtained by subtracting one from the order number of the intelligent magic cube. The intelligent magic cube further includes a rotating ring rotatably connected to the tubular shaft and fixedly connected to the signal selector or the signal exciter of the corresponding state signal sending set, and the rotating ring drives a face block and a prism block on a same plane to rotate around the tubular shaft.

[0008] Furthermore, an activating device may be further included. The activating device includes an acceleration sensor or an activating button, and is connected to the central control module.

[0009] Furthermore, a display screen and/or a sounding device may be further included. The display screen and/or the sounding device are connected to the output

unit.

[0010] The timing method of the above-mentioned intelligent magic cube includes: monitoring in real-time, by the central control module, a change in the state signal sent by the state signal sending set, the change being caused by rotation of the intelligent magic cube; and obtaining a real-time state of the intelligent magic cube. The timing method includes a timing activating process and a timing termination process, the timing termination process is a process in which when the central control module detects that the real-time state of the magic cube returns to an original state of the magic cube, the timing is terminated.

that the central control module monitors in real-time the change of the state signal sent by the state signal sending set caused by the rotation of the intelligent magic cube, thereby obtaining the real-time state of the intelligent magic cube, and further includes a timing activating process and a timing termination process, wherein for the timing termination process, when the central control module detects that the real-time state of the magic cube returns to the original state of the magic cube, the timing may be terminated. When the intelligent magic cube has an activating device, the timing activating process may be activated by sensing an acceleration change of the intelligent magic cube, or by a button signal.

[0011] Due to using the novel sensing shaft center structure, the intelligent magic cube disclosed in the present disclosure has the ability to obtain the real-time state of the magic cube, so that the online magic cube competition can be realized. Furthermore, since the ability to obtain the real-time state of magic cube is not realized by the way of image capture, the technical complexity and equipment complexity are very low, and it is easy to be popularized, thereby changing the traditional play mode of the magic cube.

BRIEF DESCRIPTION OF THE DRAWING

[0012] In order to more clearly illustrate the technical solutions in the embodiments of the present disclosure, the drawings used in the description of the embodiments will be briefly described below. It is apparent that the described drawings are only a part of the embodiments of the present disclosure, and not all of the embodiments, and those skilled in the art can obtain other designs and drawings according to the drawings without any creative work.

FIG. 1 is a perspective diagram illustrating a sensing shaft center structure used in the intelligent magic cube.

FIG. 2 is a full cross-sectional diagram taken along line A-A of FIG. 1.

FIG. 3 is a full cross-sectional diagram of Embodiment 1.

FIG. 4 is a full cross-sectional diagram of Embodiment 2.

FIG. 5 is a schematic structural diagram of Embodiment 3.

FIG. 6 is a schematic diagram of Embodiment 4.

FIG. 7 is a schematic diagram of Embodiment 5.

DETAILED DESCRIPTION

[0013] The concept, the specific structure and the technical effects of the present disclosure will be clearly and completely described in conjunction with the embodiments and the accompanying drawings in order to fully understand the objects, features and effects of the present disclosure. It is apparent that the described embodiments are only a part of the embodiments of the present disclosure, and not all of the embodiments, and other embodiments obtained by those skilled in the art based on the embodiments of the present disclosure without creative efforts fall within the protection scope of the present disclosure. In addition, all the coupling / connecting relationships mentioned herein do not refer to the members directly connected to each other, but refer to a better coupling structure that can be constituted by adding or reducing coupling accessories according to the specific implementation. The various technical features in the present disclosure can be combined with each other without conflicts.

[0014] As shown in FIG. 1 and FIG. 2, a sensing shaft center structure for an intelligent magic cube includes a body. The body includes a core 1 having an internal cavity, and a plurality of tubular shafts 2 connected to the core 1. The cavity is provided with an internal central control module 3 including a state obtaining unit. The tubular shaft 2 is provided with a state signal sending set 4 including a signal selector and a plurality of signal exciters. The signal selector can be paired with any one of the signal exciter, and generate a corresponding state signal, and the state obtaining unit is configured to receive a state signal sent from the state signal sending set 4. The state signal sending set 4 includes an annular contact piece 41, an arc contact piece 42, and a brush 43. The annular contact piece 41 is arranged around the outer wall of the tubular shaft 2. A plurality of arc contact pieces 42 are located on an annular ring arranged in parallel with the annular contact piece 41. The annular contact piece 41 and each arc contact piece 42 are respectively connected to the state obtaining unit. The brush 43 can touch the annular contact piece 41 and any one of the arc contact pieces 42 at the same time, and the state obtaining unit is configured to receive the state signals of the annular contact piece 41 and any one of the arc contact piece 42.

[0015] Furthermore, as a preferred embodiment, the central control module 3 further includes a signal sending unit, a signal receiving unit, and an output unit. The signal sending unit is configured to send the state signal received by the state obtaining unit to a signal receiving device of a peripheral device wirelessly. The signal receiving unit is configured to receive feedback data from

a processing device of the peripheral device. The output unit is connected to the signal receiving unit. In this embodiment, the state signal received by the state obtaining unit is wirelessly sent to the signal receiving device of the peripheral device, and compiled and processed by an external processor. And then obtained data is sent back to the signal receiving unit, and fed back to the player via the output unit.

[0016] Furthermore, as a preferred embodiment, the central control module 3 further includes a processing unit and an output unit. The processing unit is configured to process the state signal provided by the state obtaining unit, and the output unit is connected to the processing unit. In this embodiment, the state signal is directly processed and converted in the central control module 3, and then fed back to the player via the output unit. Furthermore, the central control module 3 further includes an output data sending unit configured to send the data output from the processing unit to the data receiving device of the peripheral device.

[0017] An intelligent magic cube includes a shaft center and center blocks. The shaft center may be a sensing shaft center structure. The number of the center blocks may correspond to the number of the tubular shafts 2. Each of the center blocks may be rotatably connected to an end of a corresponding tubular shaft 2. Each of the center blocks is fixedly connected to the signal selector or the signal exciter of a corresponding state signal sending set 4. The intelligent magic cube further includes an activating device including an acceleration sensor or a activating button, and connected to the central control module.

Embodiment 1

[0018] As shown in FIG. 3, a third-order intelligent magic cube includes a sensing shaft center structure, a center block 7-1, a prism block 8-1, and a corner block. The contact piece set on the tubular shaft 2 includes one annular contact piece 41 and four arc contact pieces 42 corresponding to four planes of the magic cube parallel to the tubular shaft 2 respectively. The brush 43 is fixedly connected to the center block 7-1. When the plane where the center block 7-1 is located is rotated, the position of the brush 43 is changed, so that the connection relationship between the annular contact piece 41 and the arc contact piece 42 is changed. The state signal is recorded by the state obtaining unit, and the state signal is converted into the real-time state of the third-order intelligent magic cube by the processing unit in the central control module 3.

Embodiment 2

[0019] As shown in FIG. 4, a second-order intelligent magic cube includes a sensing shaft center structure, a center block 7-2, and a prism block 8-2. The contact piece set on the tubular shaft 2 includes one annular contact piece 41 and four arc contact pieces 42 corresponding to four planes of the magic cube parallel to the tubular shaft 2 respectively. The brush 43 is fixedly connected to the center block 7-2. When the plane where the center block 7-2 is located is rotated, the position of the brush 43 is changed, so that the connection relationship between the annular contact piece 41 and the arc contact piece 42 is changed. The state obtaining unit records the state signal, and sends the state signal to a personal computer or a handheld electronic equipment of a player by the signal sending unit in the central control module 3. The state signal may be converted to obtain the real-time state of the second-order intelligent magic cube.

Embodiment 3

[0020] As shown in FIG. 5, the fifth-order intelligent magic cube includes a sensing shaft center structure, a center block 7-2 and a rotating ring 5. The tubular shaft 2 is provided with a plurality of state signal sending sets 4, and one tubular shaft 2 is provided with two state signal sending sets 4. The rotating ring 5 is rotatably connected to the tubular shaft 2 and fixedly connected to the signal selector or the signal exciter of the corresponding state signal sending set 4. The rotating ring 5 drives the face block and the prism block on the same plane to rotate around the tubular shaft 2.

[0021] Furthermore, as a preferred embodiment, the fifth-order intelligent magic cube includes a display screen and/or a sounding device connected to the output unit. The display screen can show information such as the game time, and the sounding device such as a buzzer can prompt a start time or an end time.

Embodiment 4

[0022] The state signal sending set 4 may also be implemented in a form of photoelectric induction. As shown in FIG. 6, the state signal sending set 4 includes a light source 44, a blocking plate 45, and a plurality of light receivers 46. The blocking plate 45 is fixedly connected to the center block, and the blocking plate 45 is provided with a gap. When the gap is aligned with the light receiver 46, the light receiver 46 can receive light from the light source 44 and send the state signal.

Embodiment 5

[0023] The state signal sending set 4 may also be implemented in a form of electromagnetic induction. As shown in FIG. 7, the state signal sending set 4 includes a Hall sensor 47 and a plurality of magnets. The magnetic field strengths of the magnets are different from each other. The Hall sensor 47 is fixedly connected to the center block. When the center block rotates, the Hall sensor 47 generates different voltages during passing the different magnets, thereby identifying the direction of rotation and sending the state signal.

[0024] The timing method of the above-mentioned intelligent magic cube includes: monitoring in real-time, by the central control module, a change in the state signal caused by rotation of the intelligent magic cube; and obtaining a real-time state of the intelligent magic cube. The timing method includes a timing activating process and a timing termination process, and the timing termination process is a process in which when the central control module detects that the real-time state of the magic cube returns to an original state of the magic cube, the timing is terminated.

[0025] Furthermore, as a preferred embodiment, the intelligent magic cube includes an activating device including an acceleration sensor or an activating button connected to the central control module. The timing activating process is activated by sensing the acceleration change, or by pressing a button.

Claims

1. A sensing shaft center structure for an intelligent magic cube, comprising a body, wherein the body comprises a core (1) having an internal cavity, and a plurality of tubular shafts (2) connected to the core (1), wherein each tubular shaft (2) is provided with a state signal sending set (4) comprising a signal selector and a plurality of signal exciters, and wherein the signal selector is pairable with any one of the signal exciters to generate a corresponding state signal,
   characterized in that:
   the cavity inside the core (1) is provided with an internal central control module (3) comprising:
   a state obtaining unit configured to receive a state signal sent from the state signal sending set (4); and a signal sending unit configured to send the state signal received by the state obtaining unit to a signal receiving device of a peripheral device wirelessly.

2. The sensing shaft center structure of claim 1, wherein the central control module (3) further comprises a signal receiving unit and an output unit, wherein the signal receiving unit is configured to receive feedback data from a processing device of the peripheral device, and the output unit is connected to the signal receiving unit.

3. The sensing shaft center structure claim 1, wherein the central control module (3) further comprises a processing unit and an output unit, and wherein the processing unit is configured to process the state signal provided by the state obtaining unit, and the output unit is connected to the processing unit.

4. The sensing shaft center structure of claim 3, wherein the central control module (3) further comprises an output data sending unit configured to send data output from the processing unit to a data receiving device of the peripheral device.

5. An intelligent magic cube, comprising a shaft center and center blocks, wherein the shaft center is an sensing shaft center structure of any one of claims 1-4, the number of the center blocks corresponds to the number of the tubular shafts (2), each of the center blocks is rotatably connected to an end of a corresponding tubular shaft (2), and each of the center blocks is fixedly connected to the signal selector or the signal exciters of a corresponding state signal sending set (4).

6. The intelligent magic cube of claim 5, wherein the intelligent magic cube is an odd-order magic cube with a fifth or higher order and comprises a face block and a prism block, each tubular shaft (2) is provided with a plurality of state signal sending sets (4), the number of the state signal sending sets (4) on one tubular shaft (2) is a half of a value obtained by subtracting one from the order number of the intelligent magic cube, and wherein the intelligent magic cube further comprises a rotating ring (5) rotatably connected to the tubular shaft (2) and fixedly connected to the signal selector or the signal exciter of a corresponding state signal sending set (4), and the rotating ring (5) drives the face block and the prism block on a same plane to rotate around the tubular shaft (2).

7. The intelligent magic cube of claim 5 or 6, further comprising an activating device comprising an acceleration sensor or an activating button, wherein the activating device is connected to the central control module.

8. A timing method of the intelligent magic cube of any one of claims 5-7, comprising:

   monitoring in real-time, by the central control module, a change in the state signal sent by the state signal sending set, the change being caused by rotation of the intelligent magic cube; and
   obtaining a real-time state of the intelligent magic cube,
   wherein the timing method comprises a timing activating process and a timing termination process, and the timing termination process is a process in which when the central control module detects that the real-time state of the magic cube returns to an original state of the magic cube, the timing is terminated.

9. The timing method of claim 8, wherein the intelligent magic cube is the intelligent magic cube of claim 7, and the timing activating process is activated by

sensing an acceleration change of the intelligent magic cube, or by a button signal.

Patentansprüche

1. Erfassungsschaft-Mittenstruktur für einen intelligenten Zauberwürfel, umfassend einen Körper, wobei der Körper Folgendes umfasst: einen Kern (1) mit einem inneren Hohlraum und eine Vielzahl von rohrförmigen Schäften (2), die mit dem Kern (1) verbunden sind, wobei jeder rohrförmige Schaft (2) mit einem Zustandssignal-Sendesatz (4) vorgesehen ist, der einen Signalselektor und eine Vielzahl von Signalerregern umfasst, und wobei der Signalselektor mit einem beliebigen der Signalerreger gepaart werden kann, um ein entsprechendes Zustandssignal zu erzeugen,
dadurch gekennzeichnet, dass:
der Hohlraum im Inneren des Kerns (1) mit einem inneren zentralen Steuermodul (3) vorgesehen ist, umfassend: eine Zustandsermittlungseinheit, die konfiguriert ist, um ein von dem Zustandssignal-Sendesatz (4) gesendetes Zustandssignal zu empfangen; und eine Signalsendeeinheit, die konfiguriert ist, um das von der Zustandsermittlungseinheit empfangene Zustandssignal drahtlos an eine Signalempfangsvorrichtung eines Peripheriegeräts zu senden.

2. Erfassungsschaft-Mittenstruktur nach Anspruch 1, wobei das zentrale Steuermodul (3) ferner eine Signalempfangseinheit und eine Ausgabeeinheit umfasst, wobei die Signalempfangseinheit konfiguriert ist, um Rückmeldungsdaten von einer Verarbeitungsvorrichtung des Peripheriegeräts zu empfangen, und die Ausgabeeinheit mit der Signalempfangseinheit verbunden ist.

3. Erfassungsschaft-Mittenstruktur nach Anspruch 1, wobei das zentrale Steuermodul (3) ferner eine Verarbeitungseinheit und eine Ausgabeeinheit umfasst und wobei die Verarbeitungseinheit konfiguriert ist, um das von der Zustandsermittlungseinheit vorgesehene Zustandssignal zu verarbeiten, und die Ausgabeeinheit mit der Verarbeitungseinheit verbunden ist.

4. Erfassungsschaft-Mittenstruktur nach Anspruch 3, wobei das zentrale Steuermodul (3) ferner eine Ausgabedaten-Sendeeinheit umfasst, die konfiguriert ist, um Daten, die von der Verarbeitungseinheit ausgegeben werden, an eine Datenempfangsvorrichtung des Peripheriegeräts zu senden.

5. Intelligenter Zauberwürfel, umfassend eine Schaftmitte und Mittenblöcke, wobei die Schaftmitte eine Erfassungsschaft-Mittenstruktur nach einem der Ansprüche 1 bis 4 ist, die Anzahl der Mittenblöcke der Anzahl der rohrförmigen Schäfte (2) entspricht, jeder der Mittenblöcke drehbar mit einem Ende eines entsprechenden rohrförmigen Schafts (2) verbunden ist und jeder der Mittenblöcke fest mit dem Signalselektor oder den Signalerregern eines entsprechenden Zustandssignal-Sendesatzes (4) verbunden ist.

6. Intelligenter Zauberwürfel nach Anspruch 5, wobei der intelligente Zauberwürfel ein Zauberwürfel ungerader Ordnung mit einer fünften oder höheren Ordnung ist und einen Flächenblock und einen Prismenblock umfasst, jeder rohrförmige Schaft (2) mit einer Vielzahl von Zustandssignal-Sendesätzen (4) vorgesehen ist, die Anzahl der Zustandssignal-Sendesätze (4) auf einem rohrförmigen Schaft (2) die Hälfte eines Wertes ist, der durch Subtraktion von eins von der Ordnungszahl des intelligenten Zauberwürfels erhalten wird, und wobei der intelligente Zauberwürfel ferner einen Drehring (5) umfasst, der drehbar mit dem rohrförmigen Schaft (2) verbunden ist und fest mit dem Signalselektor oder dem Signalerreger eines entsprechenden Zustandssignal-Sendesatzes (4) verbunden ist, und der Drehring (5) den Flächenblock und den Prismenblock in einer gleichen Ebene antreibt, um sich um den rohrförmigen Schaft (2) zu drehen.

7. Intelligenter Zauberwürfel nach Anspruch 5 oder 6, ferner umfassend eine Aktivierungsvorrichtung, die einen Beschleunigungssensor oder eine Aktivierungstaste umfasst, wobei die Aktivierungsvorrichtung mit dem zentralen Steuermodul verbunden ist.

8. Zeitsteuerungsverfahren des intelligenten Zauberwürfels nach einem der Ansprüche 5 bis 7, umfassend:

Überwachen in Echtzeit durch das zentrale Steuermodul einer Änderung in dem vom Zustandssignal-Sendesatz gesendeten Zustandssignal, wobei die Änderung durch die Drehung des intelligenten Zauberwürfels verursacht wird; und
Ermitteln eines Echtzeitzustand des intelligenten Zauberwürfels,
wobei das Zeitsteuerungsverfahren ein Zeitsteuerungsaktivierungsverfahren und ein Zeitsteuerungsbeendigungsverfahren umfasst und das Zeitsteuerungsbeendigungsverfahren ein Verfahren ist, bei dem, wenn das zentrale Steuermodul erfasst, dass der Echtzeitzustand des Zauberwürfels zu einem ursprünglichen Zustand des Zauberwürfels zurückkehrt, die Zeitsteuerung beendet wird.

9. Zeitsteuerungsverfahren nach Anspruch 8, wobei der intelligente Zauberwürfel der intelligente Zauber-

würfel nach Anspruch 7 ist und das Zeitsteuerungsaktivierungsverfahren durch Erfassen einer Beschleunigungsänderung des intelligenten Zauberwürfels oder durch ein Tastensignal aktiviert wird.

Revendications

1. Structure de centre d'arbre de détection pour un cube magique intelligent, comprenant un corps, dans laquelle le corps comprend une noyau (1) ayant une cavité interne, et une pluralité d'arbres tubulaires (2) raccordés au noyau (1), dans laquelle chaque arbre tubulaire (2) est pourvu d'un ensemble d'envoi de signal d'état (4) comprenant un sélecteur de signal et une pluralité d'exciteurs de signal, et dans laquelle le sélecteur de signal peut être apparié à un quelconque des exciteurs de signal pour générer un signal d'état correspondant,
caractérisée en ce que :
la cavité à l'intérieur du noyau (1) est pourvue d'un module de commande central interne (3) comprenant : une unité d'obtention d'état configurée pour recevoir un signal d'état envoyé à partir de l'ensemble d'envoi de signal d'état (4) ; et une unité d'envoi de signal configurée pour envoyer le signal d'état reçu par l'unité d'obtention d'état à un dispositif de réception de signal d'un dispositif périphérique sans fil.

2. Structure de centre d'arbre de détection selon la revendication 1, dans laquelle le module de commande central (3) comprend en outre une unité de réception de signal et une unité de sortie, dans laquelle l'unité de réception de signal est configurée pour recevoir des données de rétroaction à partir d'un dispositif de traitement du dispositif périphérique, et l'unité de sortie est connectée à l'unité de réception de signal.

3. Structure de centre d'arbre de détection selon la revendication 1, dans laquelle le module de commande central (3) comprend en outre une unité de traitement et une unité de sortie, et dans laquelle l'unité de traitement est configurée pour traiter le signal d'état fourni par l'unité d'obtention d'état, et l'unité de sortie est connectée à l'unité de traitement.

4. Structure de centre d'arbre de détection selon la revendication 3, dans laquelle le module de commande central (3) comprend en outre une unité d'envoi de données de sortie configurée pour envoyer des données, produites en sortie à partir de l'unité de traitement, à un dispositif de réception de données du dispositif périphérique.

5. Cube magique intelligent, comprenant un centre d'arbre et des blocs de centre, dans lequel le centre d'arbre est une structure de centre d'arbre de détection de l'une quelconque des revendications 1 à 4, le nombre des blocs de centre correspond au nombre des arbres tubulaires (2), chacun des blocs de centre est raccordé de façon rotative à une extrémité d'un arbre tubulaire correspondant (2), et chacun des blocs de centre est raccordé de façon fixe au sélecteur de signal ou aux exciteurs de signal d'un ensemble d'envoi de signal d'état correspondant (4).

6. Cube magique intelligent selon la revendication 5, dans lequel le cube magique intelligent est un cube magique d'ordre impair avec un cinquième ordre ou ordre plus élevé et comprend un bloc de face et un bloc de prisme, chaque arbre tubulaire (2) est pourvu d'une pluralité d'ensembles d'envoi de signal d'état (4), le nombre des ensembles d'envoi de signal d'état (4) sur un arbre tubulaire (2) est une moitié d'une valeur obtenue en soustrayant un à partir du numéro d'ordre du cube magique intelligent, et dans lequel le cube magique intelligent comprend en outre une bague rotative (5) raccordée de façon rotative à l'arbre tubulaire (2) et raccordée de façon fixe au sélecteur de signal ou à l'exciteur de signal d'un ensemble d'envoi de signal d'état correspondant (4), et la bague rotative (5) entraîne le bloc de face et le bloc de prisme sur un même plan pour entrer en rotation autour de l'arbre tubulaire (2).

7. Cube magique intelligent selon la revendication 5 ou 6, comprenant en outre un dispositif d'activation comprenant un capteur d'accélération ou un bouton d'activation, dans lequel le dispositif d'activation est connecté au module de commande central.

8. Procédé de synchronisation du cube magique intelligent de l'une quelconque des revendications 5 à 7, comprenant :

la surveillance en temps réel, par le module de commande central, d'un changement du signal d'état envoyé par l'ensemble d'envoi de signal d'état, le changement étant causé par la rotation du cube magique intelligent ; et
l'obtention d'un état en temps réel du cube magique intelligent,
dans lequel le procédé de synchronisation comprend un processus d'activation de synchronisation et un processus de terminaison de synchronisation, et le processus de terminaison de synchronisation est un processus dans lequel, lorsque le module de commande central détecte que l'état en temps réel du cube magique retourne à un état d'origine du cube magique, la synchronisation est terminée.

9. Procédé de synchronisation selon la revendication 8, dans lequel le cube magique intelligent est le cube

magique intelligent de la revendication 7, et le processus d'activation de synchronisation est activé en détectant un changement d'accélération du cube magique intelligent, ou par un signal d'un bouton.

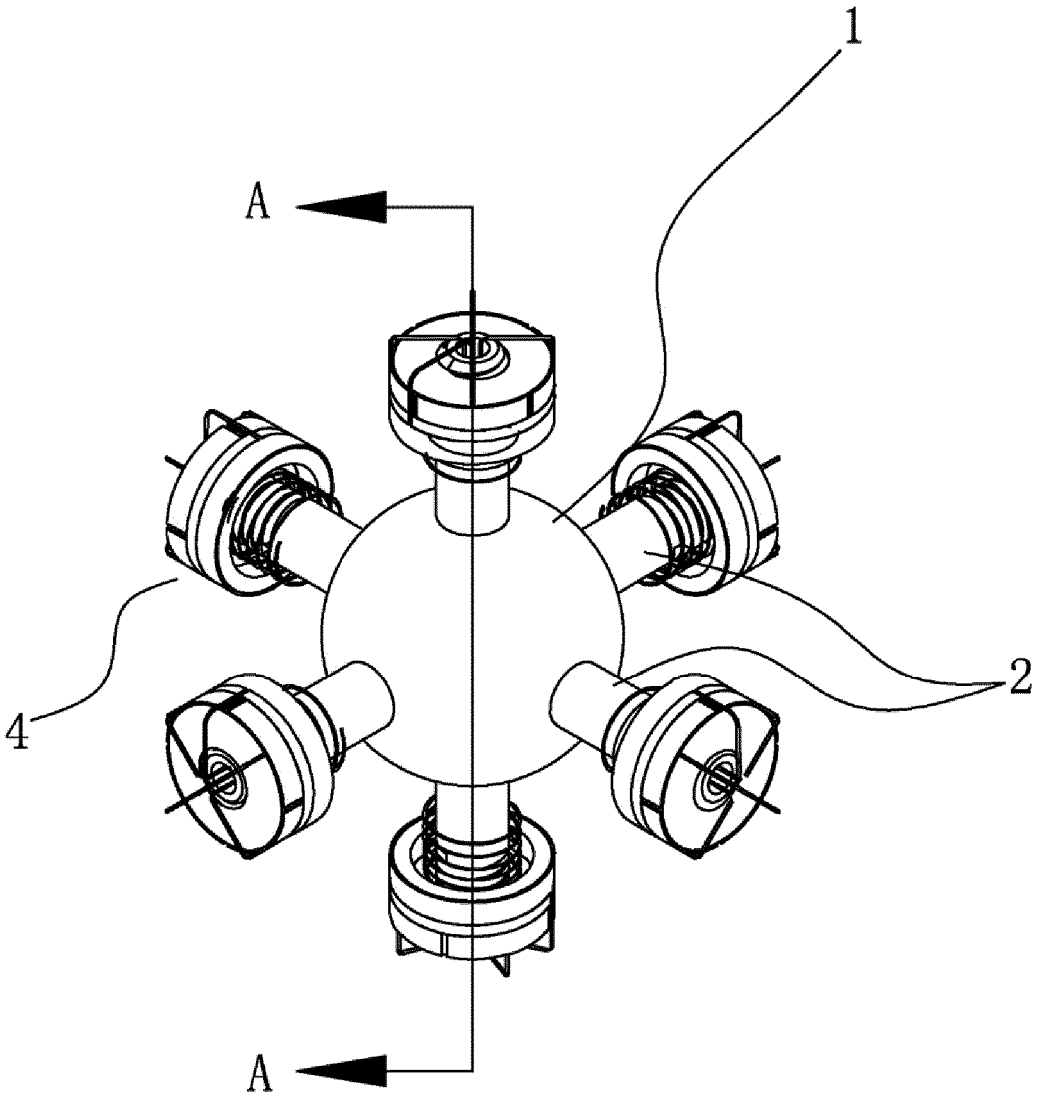

FIG. 1

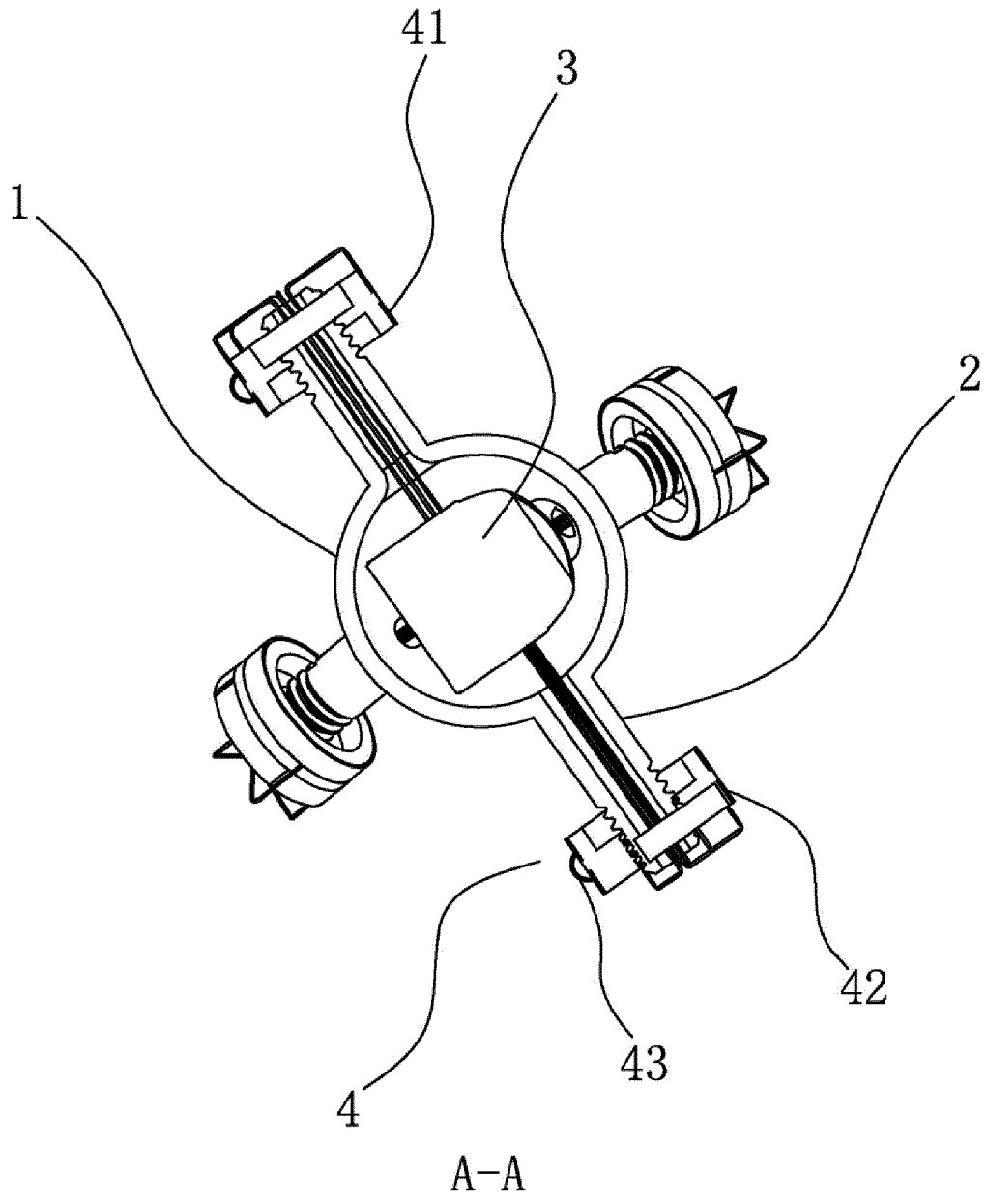

FIG. 2

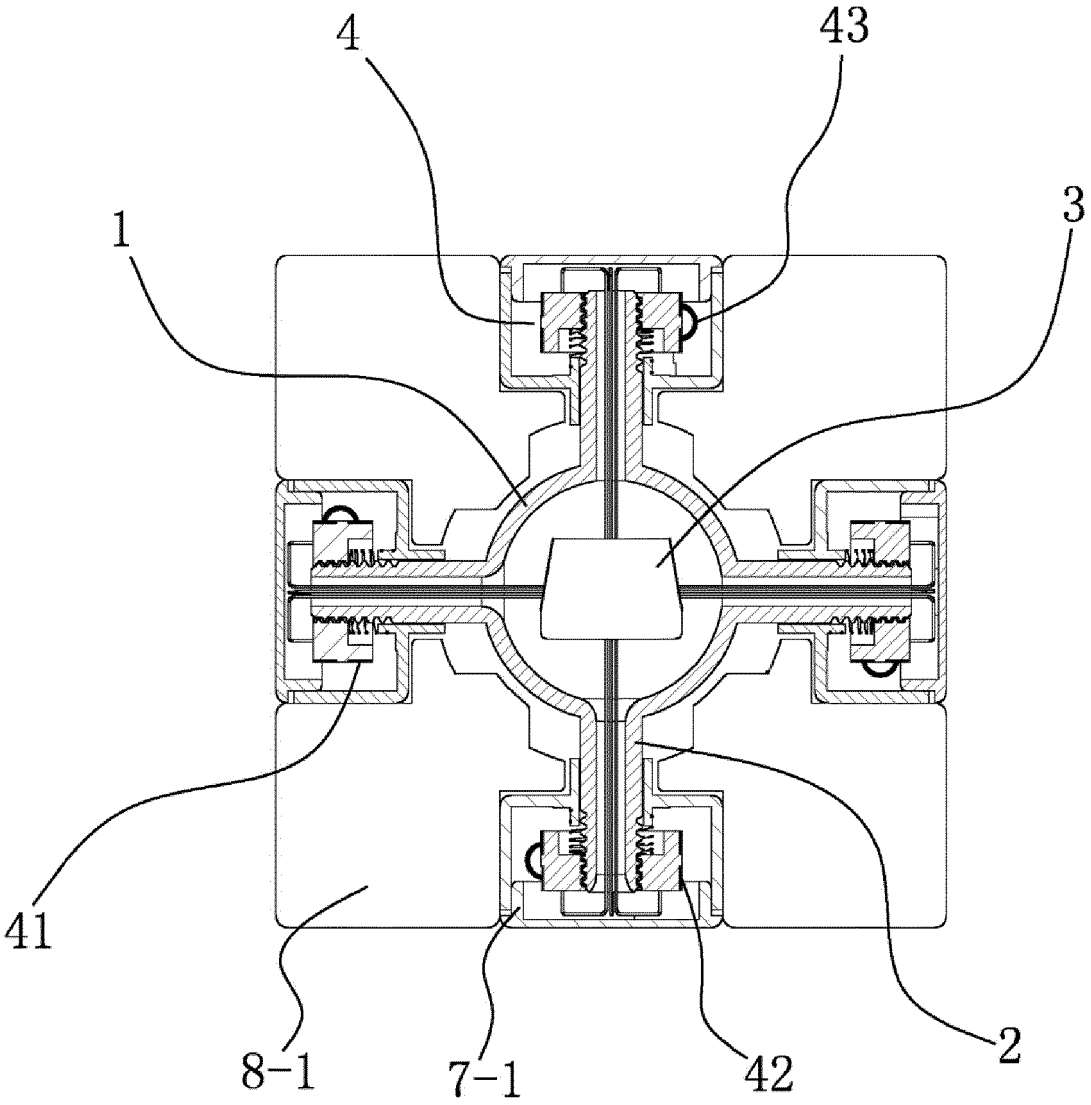

FIG. 3

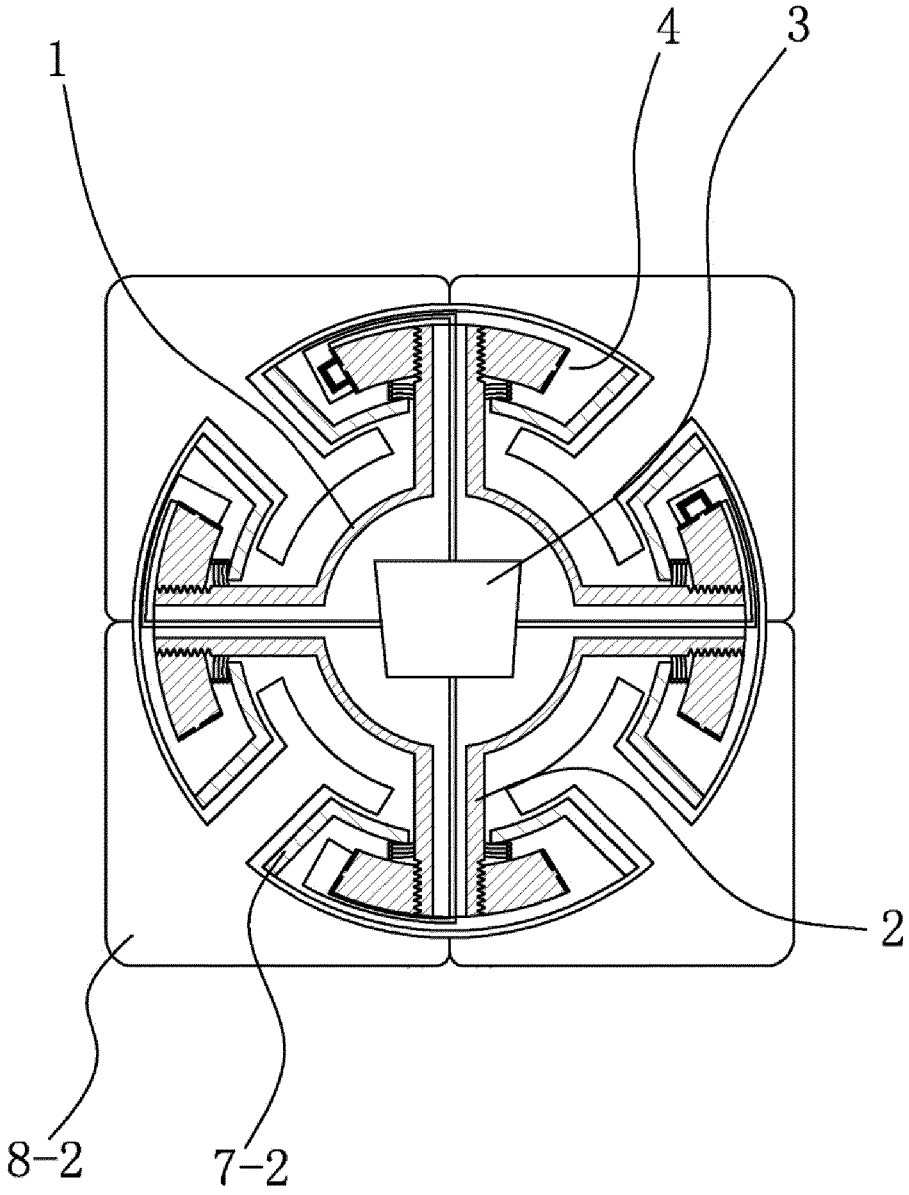

FIG. 4

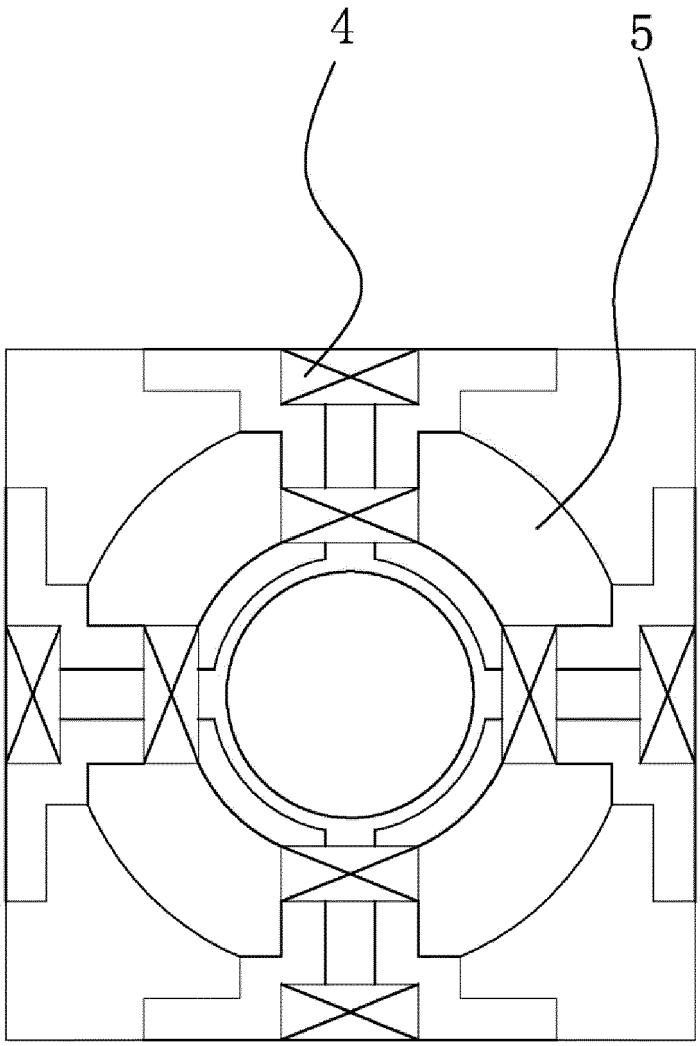

FIG. 5

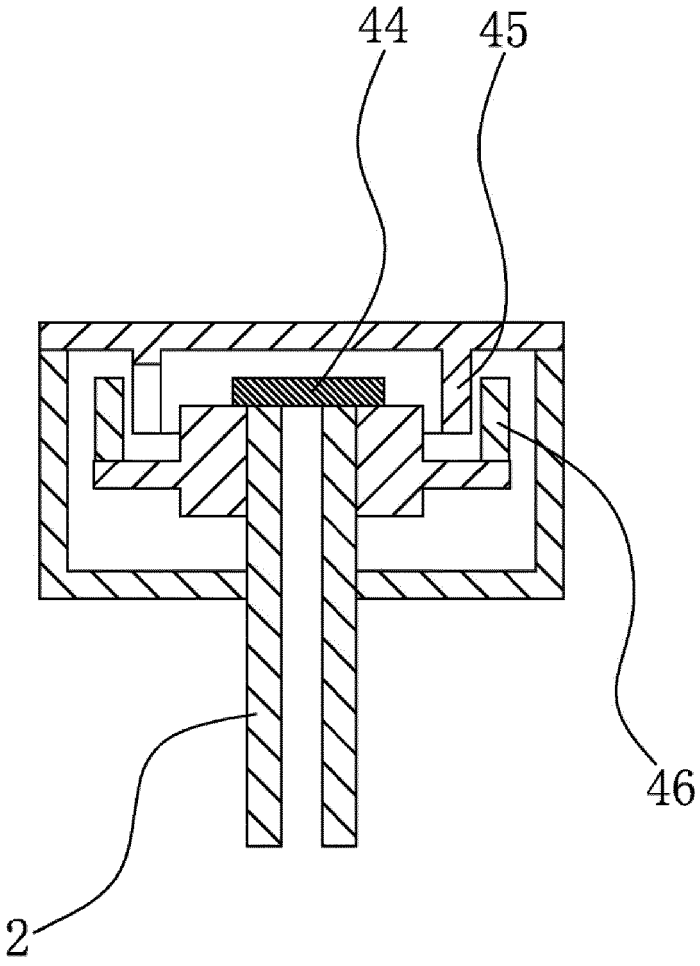

FIG. 6

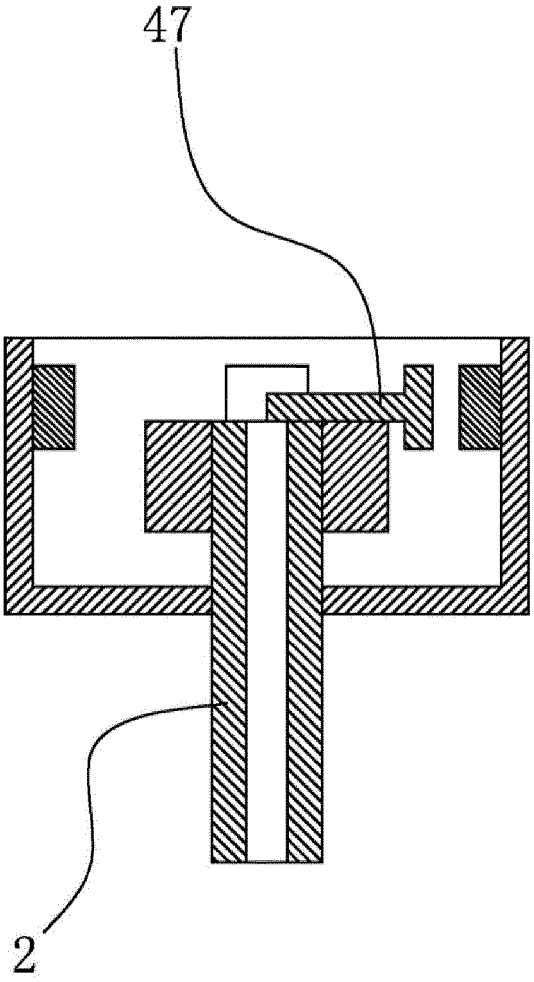

FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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